

Notice of Allowability

Application No.

09/901,458

Examiner

Wenpeng Chen

Applicant(s)

BRUNA ET AL.

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed on 5/26/2005.
2. ☒ The allowed claim(s) is/are 12-14, 16-31, 33-38 and 40-41 (now renumbered as 1-27, respectively).
3. ☒ The drawings filed on 09 July 2001 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☒ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

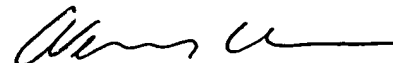
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____



Wenpeng Chen
Primary Examiner
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Examiner's Amendment/Statement

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Michael W. Taylor on 8/17/2005 to replace (a1) with (a2) and (b1) with (b2) defined below in Claims 12, 20, 28, and 35:

- (a1) determining a first number of bits required to encode the vector,
- (a2) determining a first number of bits required to encode the vector for each block,
- (b1) summing the first number of bits with a second number of bits required to encode control values,
- (b2) summing all the first numbers of bits associated with each block with a second number of bits required to encode control values.

2. Examiner's amendment

The application has been amended as follows:

Replace Claims 12, 20, 28, and 35 as attached at the end of this document.

Examiner's Statement of Reasons for Allowance

3. Claims 1-11, 15, 32 and 39 are cancelled by the Applicants.

4. Claims 12-14, 16-31, 33-38 and 40-41 (now renumbered as 1-27, respectively) are allowed.

The examiner's statement of reasons for allowance for the listed claims has already been given in Office Action paper #6 mailed on 8/20/2004.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 571-272-7437. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular communications and 571-273-8300 for After Final communications. TC 2600's customer service number is 571-272-2600.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Wenpeng Chen
Primary Examiner
Art Unit 2624

re-generated on
April 24, 2006



Examiner's amendment

12. (Currently Amended) A method for compressing a digital image comprising a matrix of elements, each element comprising at least one digital component for representing a pixel, the method comprising:

splitting the digital image into a plurality of blocks, and calculating for each block a group of discrete cosine transform (DCT) coefficients for the different types of components;

quantizing the DCT coefficients for each group using a corresponding quantization table scaled by a gain factor for achieving a target compression factor;

further quantizing the DCT coefficients for each group using the corresponding quantization table scaled by a pre-set factor;

arranging the further quantized DCT coefficients in a vector;

calculating a basic compression factor provided by the quantization table scaled by the pre-set factor as a first function of the vector, the calculating comprising

determining a first number of bits required to encode the vector for each block,

summing all the first numbers of bits associated with each block with a second number of bits required to encode control values, and

dividing the sum by a number of elements of the digital image; and estimating the gain factor as a second function of the basic compression factor, the second function being determined experimentally according to the target compression factor.

20. (Currently Presented) A method for compressing a digital image comprising a matrix of elements, each element comprising at least one digital component for representing a pixel, the method comprising:

splitting the digital image into a plurality of blocks, and calculating for each block a group of discrete cosine transform (DCT) coefficients for the different types of components;

quantizing the DCT coefficients for each group using a corresponding quantization table scaled by a gain factor for achieving a target compression factor;

further quantizing the DCT coefficients for each group using the corresponding quantization table scaled by a pre-set factor;

arranging the further quantized DCT coefficients in a vector;

calculating a basic compression factor provided by the quantization table scaled by the pre-set factor as a first function of the vector by

determining a first number of bits required to encode the vector for each block,
and

summing all the first numbers of bits associated with each block with a second number of bits required to encode control values, and dividing the sum by a number of elements of the digital image; and

estimating the gain factor as a second function of the basic compression factor.

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28. (Currently Amended) A device for compressing a digital image comprising a matrix of elements, each element comprising at least one digital component for representing a pixel, the device comprising:

discrete cosine transform (DCT) means for splitting the digital image into a plurality of blocks, and calculating for each block a group of DCT coefficients for the different types of components;

quantization means for

quantizing the DCT coefficients of each group using a corresponding quantization table scaled by a gain factor for achieving a target compression factor, and

further quantizing the DCT coefficients of each group using the corresponding quantization table scaled by a pre-set factor;

arranging means for arranging the further quantized DCT coefficients in a vector;

calculation means for calculating a basic compression factor provided by the quantization table scaled by the pre-set factor as a first function of the vector, the calculating comprising

determining a first number of bits required to encode the vector for each block,

summing all the first numbers of bits associated with each block with a second number of bits required to encode control values, and

dividing the sum by a number of elements of the digital image; and

estimation means for estimating the gain factor as a second function of the basic compression factor, the second function being determined experimentally according to the target compression factor.

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35. (Currently Amended) A digital still camera comprising:

- an image acquisition unit for transmitting light corresponding to an image of scene;
- a sensor unit connected to said image acquisition unit for providing digital image of scene, the digital image comprising a matrix of elements, each element comprising at least one digital component for representing a pixel; and
- a control device for compressing the digital image and comprising
 - a discrete cosine transform (DCT) unit splitting the digital image into a plurality of blocks, and calculating for each block a group of DCT coefficients for the different types of components;
 - a quantization unit for
 - quantizing the DCT coefficients of each group using a corresponding quantization table scaled by a gain factor for achieving a target compression factor, and
 - further quantizing the DCT coefficients of each group using the corresponding quantization table scaled by a pre-set factor;
 - a zig-zag unit for arranging the further quantized DCT coefficients a vector; and
 - a processor for calculating a basic compression factor provided by the quantization table scaled by the pre-set factor as a first function of the vector, and for estimating the gain factor as a second function of the basic compression factor, the second function being determined experimentally according to the target compression factor, and the calculating comprising

determining a first number of bits required to encode the vector for each block,

summing all the first numbers of bits associated with each block with a second number of bits required to encode control values, and

dividing the sum by a number of elements of the digital image.